el Trench Overall score Unit (0,1, or 2)	Associated with Radimpacted Building/Si	I / diacont Ironch	es TU Area m2	Box Plots	Q-Q Plots	Rounds of excavation	Gamma scan or static concerns	Summary of FSS Samples	On vs offsite lab	Time Series	Suspect name (1=yes, 0=no)	Name, if suspect	Name, if not falsify suspect g (1=Ye 0=no	falsification	to follow workpla n (1=Y,	Comments - Other	Questions for Navy	See additiona statistical ana		Talk to group	No gamma static and scan	CDPH Recommendation
TU174 0 TJ	815 NRDL Building	TU 184 and TU 18	87 424	Low variability Bi-214.	K-40 FSS_SYS plot has slope breaks indicating the potential for at least two different populations.	1	No date or time was recorded for the static survey measurements in SUPR. 2. Static survey measurements are on the higher side of the scan range and inconsistent with scan data (range much smaller than scan data range).	, , ,	Limited Offsite analysis performed on FSS samples.	NA	1	C. Bell	NA 0	NA	No sampler/surve 1 name in SUPR. static survey d and time.	Static survey date and ti not provided in SUPR Gamma static datase inconsistent with scar data (range much smal than scan data range reported)	Explain why the gamma static	C NA	NA	NA	NA	NFA
TU176 0 TJ	NA	TU 170, TU 175, T 183	ΓU 913	Form notes, "Bi-214 results have somewhat low variability, but not lower than adjacent units."	Ac-228 and K-40 plots have slope breaks suggesting multiple populations.	1	1. Static survey date and time were not provided in SUPR. Gamma static dataset consistent with scan data. 2. Static range = 6,577 - 7,189. Scan Range = 4,210 - 7,180 (investigation level = 7,240 cpm)	(next working day). The three lowest activity Ac-228		zero; two samples (08,14) results were <0.1 pCi/g for Ac-228.	1	C. Bell	NA 1	One sample counted a day later, suggesting potential for substitution.	No sampler/surve 1 name in SUPR. static survey d and time.	or No NA te	Explain why the Two samples were analyzed offsite (07, 14) Explain why Results for sampl 14 are inconsistent: K-40 offsit was -0.0214 versus onsite valu of 4.2189 pCi/g; Bi-214 offsite was 0.0141 versus onsite result of 0.18506 pCi/g	e e NA	NA	NA	NA	NFA
TU178 2 TJ	Building 820	TU 166, TU 177 ,T 179	FU 900	AC-228, Bi-214, and K-40 bias samples have lower mean and lower variability than FSS_SYS samples.	Final systematic samples display characteristics of at least two different data populations for K-40.	1	1. Gamma static measurements range from 5,004 to 5,632 cpm. 2. Gamma static dataset is less variable and inconsistent with gamma scan data and final systematic sample results. 3. Gamma scan performed on 08/24/2010 at 09:30, before collection of biased and final systematic samples. Gamma scan range reported at 3,920 – 7,060 cpm, with an investigation level of 7,204 cpm. 4. Gamma scan dataset is consistent with final systematic sample results but inconsistent with less	FSS samples were collected on 08/24/2010. Final set of confirmatory/biased samples were collected on 08/24/2010.		sample Ac-228 (sample 27) has ar unusually high result. 3. One biase sample (sample 7) and one final systematic sample (sample 27) have unusually high K-40 results.	h ic n 1 ed	C. Bell	NA 1	Final systematic samples display characteristics of at least two different data populations for k 40.	No 1 sampler/surve name in SUP		Explain why the gamma static data is inconsistent anad less variable with gamma scan dat range?	S	NA	NA	NA	Resample
TU179 2 TJ	NA	TU-166, TU-172, T 173, TU-178, TU 180		TU, also indicated K-40 activity averages	The K-40 and Ac-228 plots indicates multiple data sets. The high Ac-228 and K-40 results are indicative of pipe trench bedding sands with high NORM activity.	1	The static and scan data is inconsistent (4,978-5,459 cpm). This data appears to represent meter variations and not the activity variations found in the field survey. Scan range for the 2350-1 Instrument is 4,380 – 7,170 cpm. The 3 sigma investigation level for the 2350-1 Instrument is 7,200 cpm.	09/1/2010. FSS samples were analyzed on 09/1/2010		other HPNS soils in most of the TU1	/, ed ne o 79 1 e re	C. Bell	NA 1	Scan and static data appear to represent instrument variability, not TU 179.	No 1 sampler/surve name in SUP		data is inconsistent anad less variable with gamma scan dat	S NA	NA	NA	NA	NFA
TU180 2 TJ	NA	TU-166, TU-172, 1 173, TU-178, TU 179		Form notes, "The K-40 plot indicates high and low variations from the mean and indicate multiple populations of samples in the data set. The high activity samples are indicative of the possible bedding sands with high NORM activity. The low activity samples are likely fill original fill material with low K-40 concentrations. Bi-214 dataset has very low variability."	Bi-214 and Ac-228 sample 8 indicates lower than normal concentrations for all three plotted isotopes and should be evaluated (possible data quality issue). The K-40 plots indicate high and low variations from the mean and indicate multiple populations in the data set samples. The high activity samples are indicative of the possible bedding sands with high NORM activity. The low activity samples are likely fill original fill material with low K-40 concentrations.	1	Scan range for 2350-1 Instrument is 4,810 – 6,930 cpm 3 sigma investigation level for 2350-1 Instrument is 7,200 cpm. The static data (4,841-5,279 cpm) are inconsistent with the scan data. All static readings are at or near the lower range of the scan measurements. This data appears to represent meter variations and not the activity variations found in the field survey.	FSS samples were collected on 09/2/2010. FSS samples were analyzed on 09/2/2010. No	Two samples were analyzed offsite (01 and 02) and were consistent with the onsite results, except for K-40. Sample 01 presented: onsite 8.91 pCi/g and offsite 13.9 pCi/g. Cs-137 and Ra-226 results were equivalent.	Sample 8 indicates lower than normal concentrations for all thre- plotted isotopes and should be evaluated (possible data quality issue). K-40, Bi-214, Ac-228	e 1	A. Smith	NA 1	Static data appears to represent instrument variability, not TU 180.	No 1 sampler/surve name in SUP	Resample due to falsification of gamm static data, low variabil Bi-214 data, evidence multiple populations in 40 dataset.	Explain why the static data are inconsistent with the scan data Explain why the three isotope are lower than normal in Sample 8?	a? s NA	NA	NA	NA	NFA
U181 2 TJ	NA	TU-170, TU-173, T 175, TU-180, TU 182	ΓU- - 893	Form notes, "Usually small variance of FSS samples for Bi-214, but variance is consistent with adjacent TUs and is not as low as other TUs onsite."	K-40 FSS_SYS plot has slope breaks indicating the potential for at least two different populations.	1	Gamma static dataset is inconsistent with scan data. Static Range: 4,580 to 4,846 cpm The static readings were performed by a suspected worker and appear anomalous. The range of static readings is below the reported scan range and the low variability of static measurements does not capture the variability observed in the soil sample results. Scan Range: 5,270 to 7,130 cpm (Investigation level: 7,204 cpm)	FSS samples were analyzed on 09/7/10 and 09/8/10. Samples were collected on 09/7/10 and 09/8/10.	Two samples analyzed offsite (01 and 06): Sample 01 is inconsistent: Ac-228 onsite result was 0.29 pCi/g while the offsite result was 0.0 pCi/g (error bars overlap) Bi-214 onsite result was 0.34 pCi/g while the offsite result was -0.04 pCi/g (error bars do not overlap). Sample 06 is consistent. This issue is typical of HPNS data and not directly indicative of falsification.	NA	1	R. Roberson	NA 1	Static data appears to represent instrument variability, not TU 180.	No 1 sampler/surve name in SUP	1. Gamma scan conduct before FSS Samples collected suggesting potential that sample were only collected in areas with low reading 2. Resample due to falsified gamma static potential failure to coll representative FSS samples, very low variability in Bi-214 day evidence for multiple populations in K-40 dataset.	Explain why the static data are inconsistent with the scan data Explain why there is a different between offsite vs onsite data	a? ce NA	NA	NA	NA	NFA
U182 2 TJ	NA	SU-173, SU-175, S 181, TU-183	SU- 929	Form notes, "Low variability for Bi-214 and Ac-228; but this variability is consistent with adjacent TUs."	Ac-228 and K-40 plots have slope breaks suggesting multiple populations.	1	Form notes: 1. Gamma static dataset inconsistent with scan data and Final Systematic sample dataset. Static data exhibit anomalously tight distribution, but do not directly indicate soil sample falsification. 2. Gamma static Range: 5,113 to 5,394 cpm. 3. Scan Range: 4,220 to 7,130 cpm (Investigation level: 7,204 cpm) 4. Scan survey was performed on 09/09/2010 at 13:00, after final systematic sample collection. Gamma scan dataset is inconsistent with static data." In conclusions, form contradicts #1, stating, "evidence of potential data falsification was identified in the gamma static measurements."	09/09/10 and 09/10/2010 Sample 18 (low Ac-228	Ac-228 onsite result was 0.29 pCi/g while the offsite result was 0.0 pCi/g (error bars overlap) Bi-214 onsite result was 0.34 pCi/g while the offsite result was -0.04 pCi/g (error bars do not overlap). Sample 06 is consistent.	One sample (18) result is near zero	o. 1	C. Bell	NA 1	Gamma statics range is only 279 cpm, which is most likely instrument variability.	Sampler name in SUPR.	Resample due to proba falsification of gamm statics data, very low variability Bi-214 data, a evidence of multiple populations for K-40 at Ac-228.	Explain why the static data are inconsistent with the scan data	NΛ	NA	NA	NA	NFA
J183 2 TJ	815	TU-182, TU-184, T 166, TU-176	ΓU- 891		Two or more possible data populations for K-40. Ac-228 also appears to have a slope break indicating two populations.	1	1. Static survey date and time are not provided in SUPR. 2. Static Survey dataset is consistent with scan data Gamma static dataset consistent with scan data. 3. Scan Range =3120- 6870 (investigation level = 7,240 cpm)	· · · · · · · · · · · · · · · · · · ·	Comparison intermediate (limited offsite analyses available for comparison with FSS samples)	One FSS sample result is at or belo zero. Ac-228	w 1	C. Bell	NA 1	Two possible data populations for K-40	No sampler/surve 1 name in SUPR. static survey d and time.	or No NA te	NA	NA	NA	NA	NA	Resample
·U185 2 TJ	NA	TU-168, TU-188, T 345	ΓU- 814	Form notes, "Ac-228 and K-40 contain outliers on the higher end of the distribution"	Form notes, "Ac-228 and K-40 activities indicate the potential for at least two different data populations"		1. Scan surveys and systematic sampling were performed in TU185. TU 185 had a total surface area of 814 square meters. 2. No measurements above the investigation level were identified during the performance of gamma scans in TU185. Therefore, no additional surveys or sampling were performed. No date or time was recorded for the static survey in the SUPR. 3. Scan survey was performed on 09/24/10 at 10:00 before the commencement of Systematic post excavation samples were collected after a grid was established using the VSP. Static measurements generally agree with scan measurements. sampling. Gamma scan range reported at 3,440 to 7,040 cpm, with an investigation level of 7,204 cpm. Scan data generally agrees with the static measurements.	FSS Soil Samples were collected 9/24/2010 and Samples were counted on 9/27/2010 and 9/28/2010	Two samples for TU185 were sent offsite for analysis. One sample had an RPD of 19% which is acceptable and one with an RPD of 48% which indicates high bias by the onsite lab	Anomalously low activity concentrations with a result below zero Ac-228	v O	NA	C Hughes 1	Activities for Ac- 228 and K-40 indicate potential for at least two data populations	No sampler/surve 1 name in SUPR. static survey d and time.	or No NA te	Explain why activities for Ac-22 and K-40 indicate potential fo at least two data populations	r NA	NA	NA	NA	Resample
U187 0 TJ	NA	TU-187 connect to TU-174 on the north, TU-189 of the east, TU-16 and TU-169 on th south and TU-18 on the west	e n 6 757 ne	Low variability Bi-214.	K-40 FSS_SYS plot has slope breaks indicating the potential for at least two different populations.		Static survey date and time was not provided in the SUPR. Gamma static dataset is consistent with scan data Scan survey performed on at 10/05/2010 at 08:30 before FSS sample collection.	confirmatory/biased sample was collected on	Comparison indeterminate (limited offsite analyses available for comparison with FSS samples)	One FSS sample result was at or below zero. Ac-228	1	C. Bell	NA 0	NA	No 1 sampler/surve name in SUP	or NA	NA	NA	NA	NA	NA	NFA
J188 2 TJ	NA	TU 168 and TU 19	90 870	Bi-214 has very low variability. K-40 also appears to have low variability	Form notes, "Ac-228 and K-40 samples indicate the potential for at least two different data populations"	1	No date or time is provided in the SUPR. The Static measurements are on the low end of the gamma scan range. The scan performed on 10/06/10 at 13:15 after the commencement of sampling. Gamma scan range was reported at 2,440 to 6,990 cpm with an investigation level of 7204 cpm. Scan data are consistent with static measurements and less than the scan threshold.	Sample was collected on 10/06/10, one biased sample was collected on 10/06/10 samples counted on 10/08/10	Two samples were sent offisite for analysis This yielded one detectable Ra-226 offsite result. The resulting RPD was 97%	1. BI-214: Two results near zero 2. Ac-228 Three results near zero 3 Five results less than 2 pCi/g	3. 1	C. Bell	NA 1	activities for Ac- 228 and K-40 indicate potential for at least two data populations	No sampler/surve 1 name in SUPR. static survey d and time.	or No NA te	Explain why activities for Ac-22 and K-40 indicate potential fo at least two data populations	r NA	NA	NA	NA	Resample
J189 2 TJ	NA	TU 187 and TU 19	90 623	Ac-228 samples have a standard deviations that is greater than the mean. Bi-214 has very low variability.	Form notes, "All three plotted radionuclides have systematic sample results that indicate the potential for at least two different data populations"	1	No date or time was recorded for the static survey in SUPR. Static measurements are on the higher side of the scan range and consistent with the scan. Scan performed on 10/15/2010 at 14:00 after the comencement of the sampling. Gamma scan range was reported at 3,080 to 6,750 cpm, with an investigation level of 7,204		Only one ore two samples had detectable Ra-226 activity for both laboratories the comparison yielded an RPD of 121%.	Form notes, "FSS Systematic Sample indicate the potential for at least two data popluations" for Bi-214. "Five FSS Systematic sample result were reported with values less that zero" for Ac-228. "FSS Systematic samples indicate the potential for least two data populations" for K-4	ts ts in	C. Bell	NA 1	All three plotted radionuclides have systematic sample results that indicate the potential for at least two different data populations	No sampler/surve 1 name in SUPR. static survey d and time.	No NA	Explain why Bi-214, Ac-228 and 40 have systematic sample results that indicate the potential for at least two different data populations	K- NA	NA	NA	NA	Resample

Summary of EPA review of Parcel UC-1.2.3 and D-2 Trench Units - Interim Draft [Insert date]

	Number	of TII's			% of Parcel UC's	
Number of TU's				& D-2 total		
Parcel D-2	Parcel UC-1	Parcel UC-2	Parcel UC-3	Total		
7	12	8	21	48	100%	Total trench units in Parcel UC's & D-2
avy reviewe	d 70 total Tren	ch Units to loo	k for signs of	potential fals	ification	
4	3	0	16	23	57%	Navy recommended confirmation sampling due to signs of potential falsification
2	0	0	0	2	29%	Navy recommended reanalysis of archived samples
1	9	8	5	23	14%	Navy recommended NFA = No further action due to signs of falsification, but potential further action due to uncertainty
PA reviewea	the 23 Trench	Units recomm	ended for NFA	4		
				0	0%	EPA score 0 = No specific findings of particular concern
				0	0%	EPA Score 1 = Need further review
_				0	0%	EPA Score 2 = Need resampling before determination that the record supports ROD requirements met
1	9	8	5	23	100%	Not yet reviewed
tal Navy ar	nd EPA recomm	end for resam	pling		•	
4	3	0	16	23	57%	

4	3	0	16	23	57%
_	_	_	_	•	
Trench Unit					Overall score (0,
Tremen onic					1, or 2)
					<u> </u>
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Draft Interim EPA and DTSC review of Parcel UC-1,2,3 & Parcel D-2 Rad Data Eval

	Trench	Fill	Building Sites	Total	% of total
Tota Survey Units in Parcels UC-1,2,3 & D-2	48	80	0	128	100%
Navy recommended resampling	23	55	0	78	61%
Navy recommended reanalyzing archived samples	2	0	0	2	2%
EPA, CDPH, DTSC recommend resampling			0	0	0%
Total recommended resampling	23	55	0	78	61%
No signs of falsification found in data			0	0	0%
EPA not yet reviewed			0	0	0%
% of total recommended resampling	48%	69%	0%	61%	

The above was for Parcel B alone. Below is for entire Shipyard.

Total Survey Units in Hunters Pt Tetra Tech EC	305	514	*
Parcels D-2 & UC-1,2,3 as % of total	16%	16%	*

^{*} Parcel B has 7 former building sites, which is 21% of the total 34. The above chart shows survey units at building sites.

The number of survey units at building sites for the entire site was not available.

Breakdown for Fill

Total	% of total	D-2	UC-1	UC-2	
80	100%	5	26	20	Tota Survey Units in Parcels UC-1,2,3 & D-2
55	69%	4	14	13	Navy recommended resampling
0	0%	0	0	0	Navy recommended reanalyzing archived samples

Total % of total

	T		I			
			>=2			
Trench	No gamma static	Weight	results			
Unit	and scan	difference	Zero or			
			negative			
66	16	5	30	0	0	0
100%	24%	8%	45%	0%	0%	0%
TU001	1		1			
TU002	1		1			
TU003	1		1			
TU004	1		1			
TU005	1					
TU006	1		1			
TU007	1	1	1			
TU008	1					
TU009	1					
TU010	1					
TU011	1					
			1			
TU012	1		1			
TU013	1		1			
TU014	1					
TU015						
TU016	1					
TU017						
TU018			1			
TU019	1	1	1			
TU020	1		1			
TU021			1			
TU022			1			
TU023			1			
TU024			1			
TU025						
TU026						
TU027						
TU028			1			
TU029						
TU030						
TU033			4			
TU036			1			
TU037						
TU039			1			
TU040		1	1			
TU041						
TU042			1			
TU043						
TU044		1				
TU045			1			
TU046						
TU047						
TU048						
TU049			1			
TU050						
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TU053			1			
TU054			1			
TU055						
TU056			1			
TU058			1			
TU060		1	1			
TU061			1			
TU062						
TU062						
TU063						
TU064			1			
TU065						
TU125			1			
TU126			_			
TU127						
TU128						
10120			<u> </u>		<u> </u>	<u> </u>
TU59		1				
1033		1				

Parcel	Trench	Suspect name	Name, if suspect	Name, if not suspect
	Unit	(1=yes, 0=no)	•	
D-2	TU031	0		J. Rosenhagen
D-2	TU032	1	R. Zahensky	
D-2	TU034	0		P. Vigil
D-2	TU035	0		C. Schultz
D-2	TU038	0		P. Vigil
D-2	TU134	1	A. Smith	
UC-1	TU133	1	C. Bell	
UC-1	TU139	1	A. Smith	
UC-1	TU146	1	C. Bell	
UC-3	TU170	1	R. Roberson	
UC-3	TU172	1	C. Bell	
UC-3	TU173	1	A. Smith	
UC-3	TU174	1	C. Bell	
UC-3	TU176	1	C. Bell	
UC-3	TU178	1	C. Bell	
UC-3	TU179	1	C. Bell	
UC-3	TU180	1	A. Smith	
UC-3	TU181	1	R. Roberson	
UC-3	TU182	1	C. Bell	
UC-3	TU183	1	C. Bell	
UC-3	TU185	0		C Hughes
UC-3	TU187	1	C. Bell	
UC-3	TU188	1	C. Bell	
UC-3	TU189	1	C. Bell	